Advantages of the Industry Cluster Approach to Economic Development

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Why New Approach to Economic Development

Key messages:

- Be more strategic / be a more intelligent player
- Old ways of analyzing the economy are not enough anymore
- Location still matters—but for different reasons

Traditional economic development programs are increasingly criticized for...

- not focusing on key goals (competitiveness of business),
- targeting individual firms,
- not thinking strategically,
- not being industry driven,
- not reaching enough firms to make a difference,
- presenting a fragmented and confusing maze of programs and services,
- not being accountable to private sector clients or public sectors funders.

Place Still Matters — But for Different Reasons

"The enduring competitive advantages in a global economy lie increasingly in local things—knowledge, relationships, motivation—that distant rivals cannot match."

"This role of location has been long overlooked, despite striking evidence that innovation and competitive success in so many fields are geographically concentrated."

- Michael Porter

Firms Cluster in One Place for Bottom Line Reasons

- Reduce transaction costs
- Specialize
- Exploit one another's specialties
- Increase rates of innovation
- Pursue joint solutions to common problems
- Build a common labor pool, technology, infrastructure:
- Learn collectively what it takes to be competitive

Arizona's experience using industry clusters as...

- an analytical tool (e.g., to better understand the economy and deploy resources strategically);
- an organizational tool (e.g., to engage industry leaders in a regional strategy and foster communication networking and improvement among companies); and
- a service delivery tool (e.g., to provide high-value specialized services)

Industry Clusters as an Analytical Tool

Identifying Industry Clusters

Export Oriented:

Many of the companies in the cluster sell products or services to companies outside the region.

Concentration:

Employment in the cluster is more concentrated in the region than the national average, and the cluster is an existing or emerging area of specialization.

Business Interdependence:

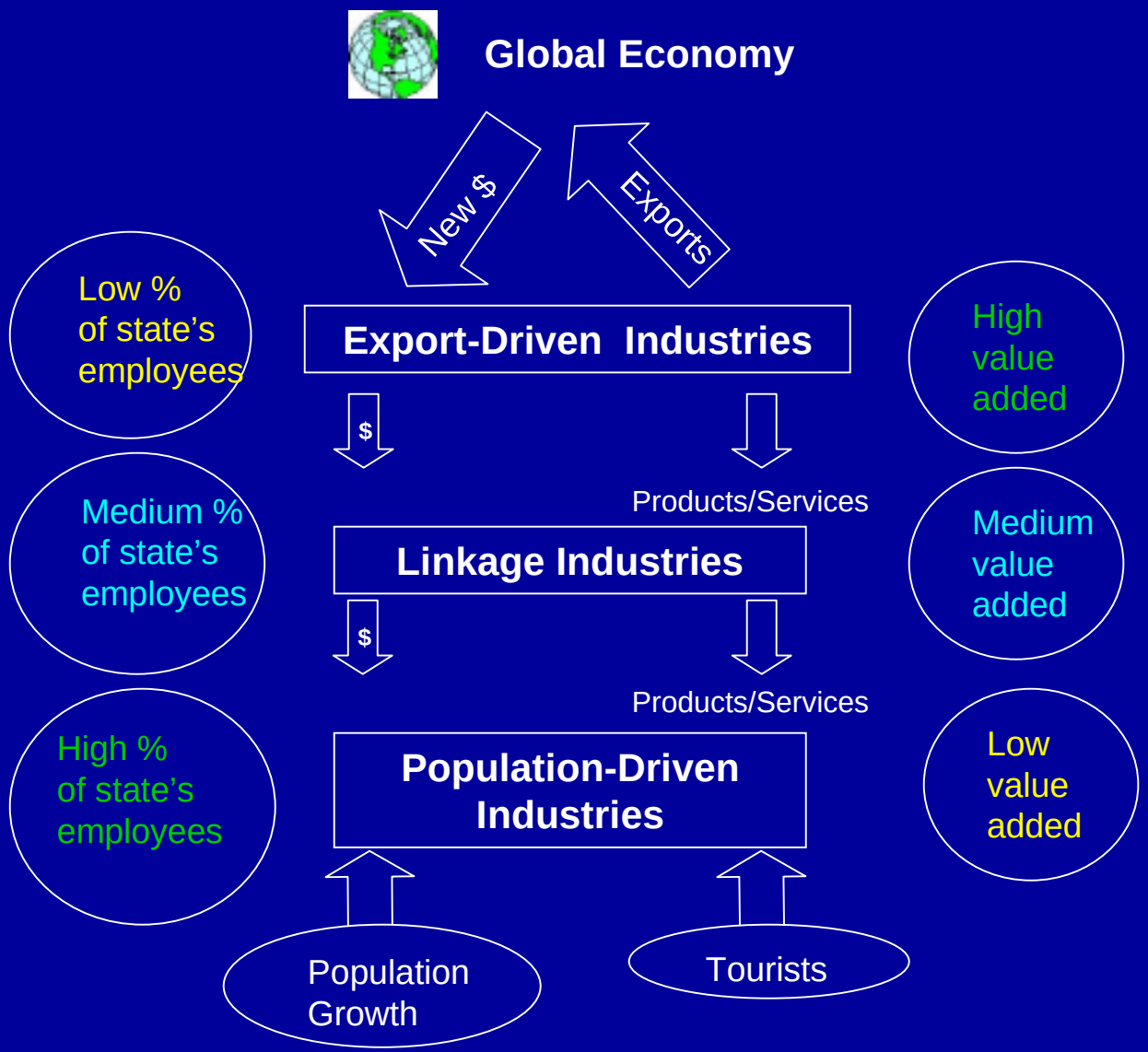
Businesses relate to each other through the buyer-supplier "food chain," as competitors, or as partners.

Significant Size or Rapid Growth:

The cluster is of a significant size or, if new, has an above average growth rate compared to that of the U.S. as a whole.

Assessing Strengths

Model 1: Creating Wealth

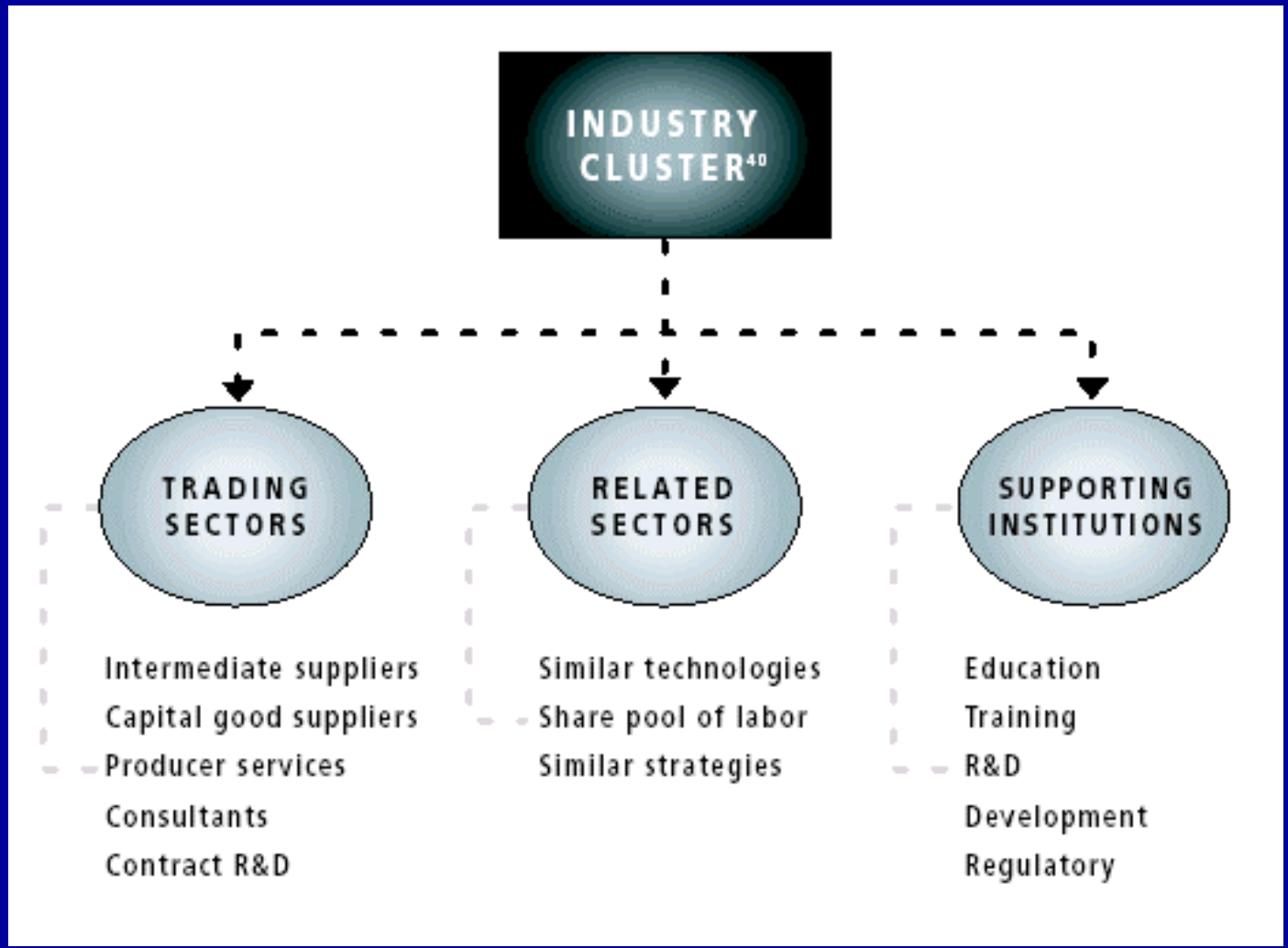


Knowledge Industry Employment Concentrations

State	Software/ Communication Services	Computer/ Electronics	HealthCare Technology	Innovation Services	Financial Services	No. of Clusters above 1.1
AZ	0.87	1.96	0.59	0.97	0.79	1
CA	1.32	2.15	1.50	1.21	0.93	4
CO	1.84	1.90	1.22	1.39	0.99	4
FL	0.93	0.75	0.96	0.91	0.96	0
IL	0.89	0.94	1.02	1.01	1.23	1
MA	1.51	2.14	1.97	1.63	1.67	5
MI	0.73	0.24	0.78	1.06	0.74	0
MN	0.90	1.82	1.39	0.65	1.13	3
NC	0.67	0.66	0.99	0.59	0.58	0
NJ	1.61	0.64	2.25	1.13	1.39	4
NY	0.99	0.76	1.12	1.02	1.85	2
PA	0.80	0.65	1.07	1.24	1.10	2
TX	1.12	1.28	0.71	1.11	0.85	3
WA	1.04	0.89	0.76	1.09	0.83	0

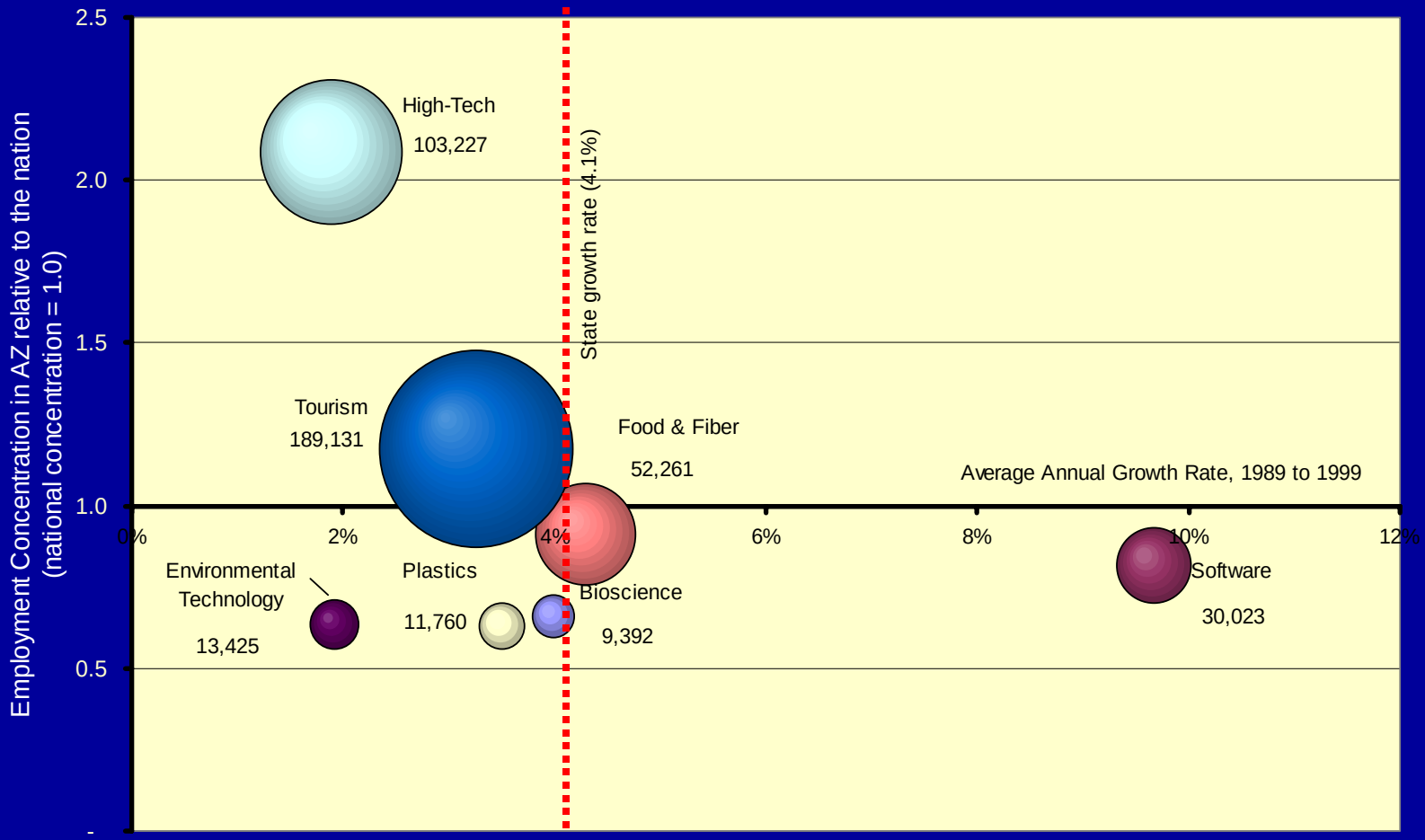
Source: Index of the Massachusetts Innovation Economy, 1998.

Determining Cluster Membership is an Art, Not a Science



Source: *Strategic Planning in the Technology-Driven World*

Key Arizona industry clusters by employment size, concentration and growth, 1989-1999



Source: Collaborative Economics, Inc.

Arizona Clusters

- High Technology (aerospace and information)
- Food, Fiber, Natural Products
- Minerals and mining
- Tourism
- Transportation
- Business Services
- Bioindustry
- Software
- Environmental Technology
- Optics
- Senior Industries
- Plastics & Advanced Materials

Industry Clusters as an Organizational Tool

Arizona's Emerging Software Cluster

Markets	Business Applications	Healthcare	Finance	Entertainment	Education
Export Products & Services	Pre-packaged	Customized Software	Programming Services	Training Customer Support	Systems Integration
Specialized Supplies	Technical Recruiting	Marketing & Distribution	Contract Workers -Programmers	Specialized Services -Capital	Computer & Telecom Sales & Service
Local Infra-structure	Universities and Community Colleges	Affordable, Flexible Space Research Parks Business Incubators	Telecom-munications	-Industry Associations -State and Local Government	Quality of Life -K-12 -Lifestyle -Culture	Large Established I.T. Firms

Charge to Each Cluster

- **Catalogue the key components** of the cluster
- **Articulate an achievable vision** of what the cluster can become over the next 10-20 years
- **Identify opportunities for growing** the cluster in the desired direction by expanding existing companies and attracting outside companies
- **Identify opportunities for more synergy** within the cluster
- **Identify needs** for specific economic foundations and proposed strategies

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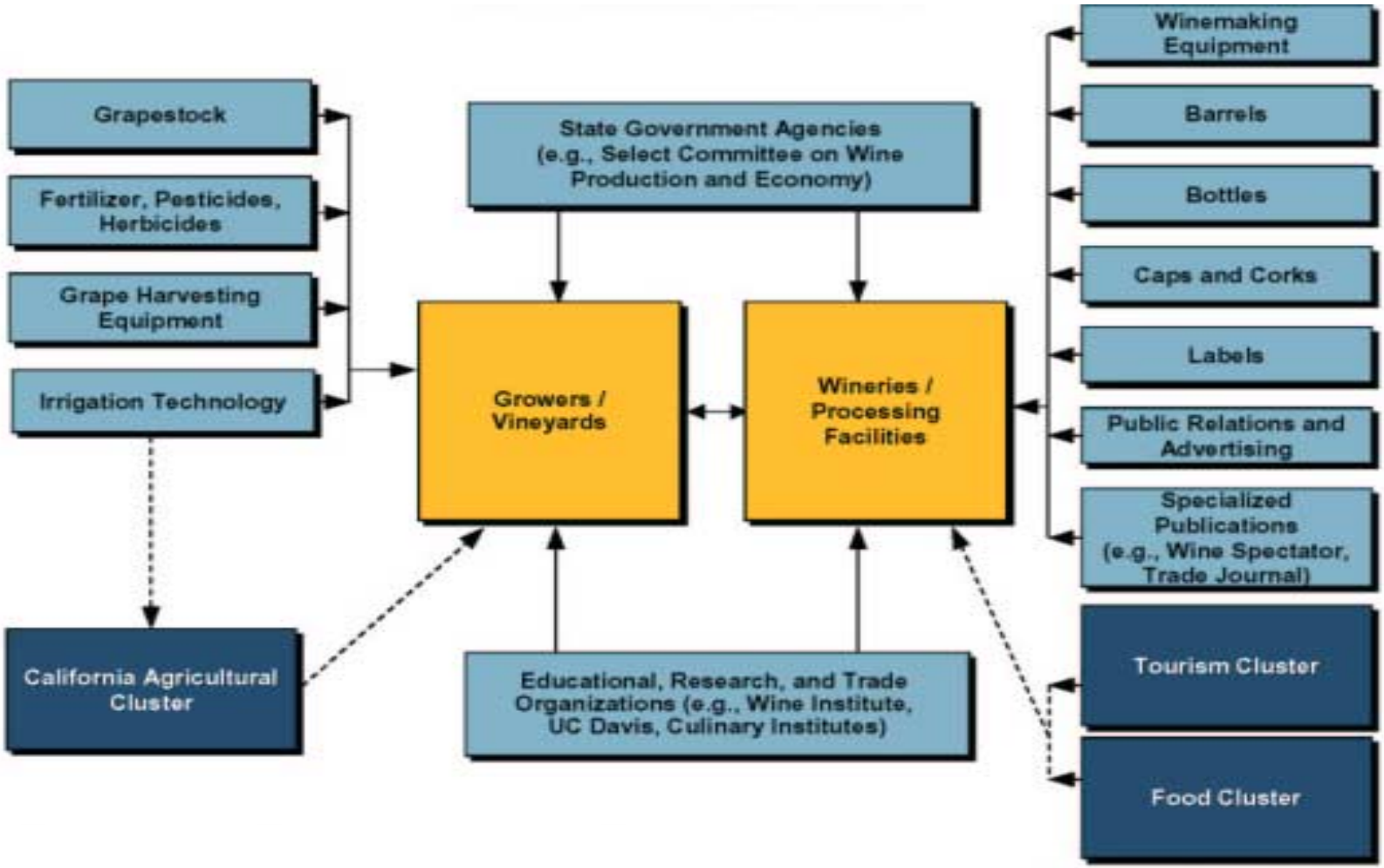
The California Wine Cluster



Source: Professor Michael E. Porter, Harvard University, Council on Competitiveness , Monitor Company Group LP and On the Frontier, 2001.

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Analytic Framework

Clusters/ Foundations	Human Resources	Technology	Capital	Infra-structure	Tax Climate	Quality of Life
Experience Industries						
Information Industries						
Aerospace & Defense						
Financial Services						
Health Industries						
Transportation Services						
Agriculture						
Mineral & Mining						

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It's About How All Industries Compete

The prosperity of a region depends on the productivity of all its industries.

Productivity does not depend on what industries a region competes in, but on how it competes.

Clusters of Innovation Initiative, 2001

Arizona Clusters
continuum of collaborative activity

Jointly inform

newsletters, electronic links, cluster directories

Jointly learn

seminars, conferences, training

Jointly market

strategic plans for exports, cluster brochures

Jointly purchase

buyer-supplier linkages

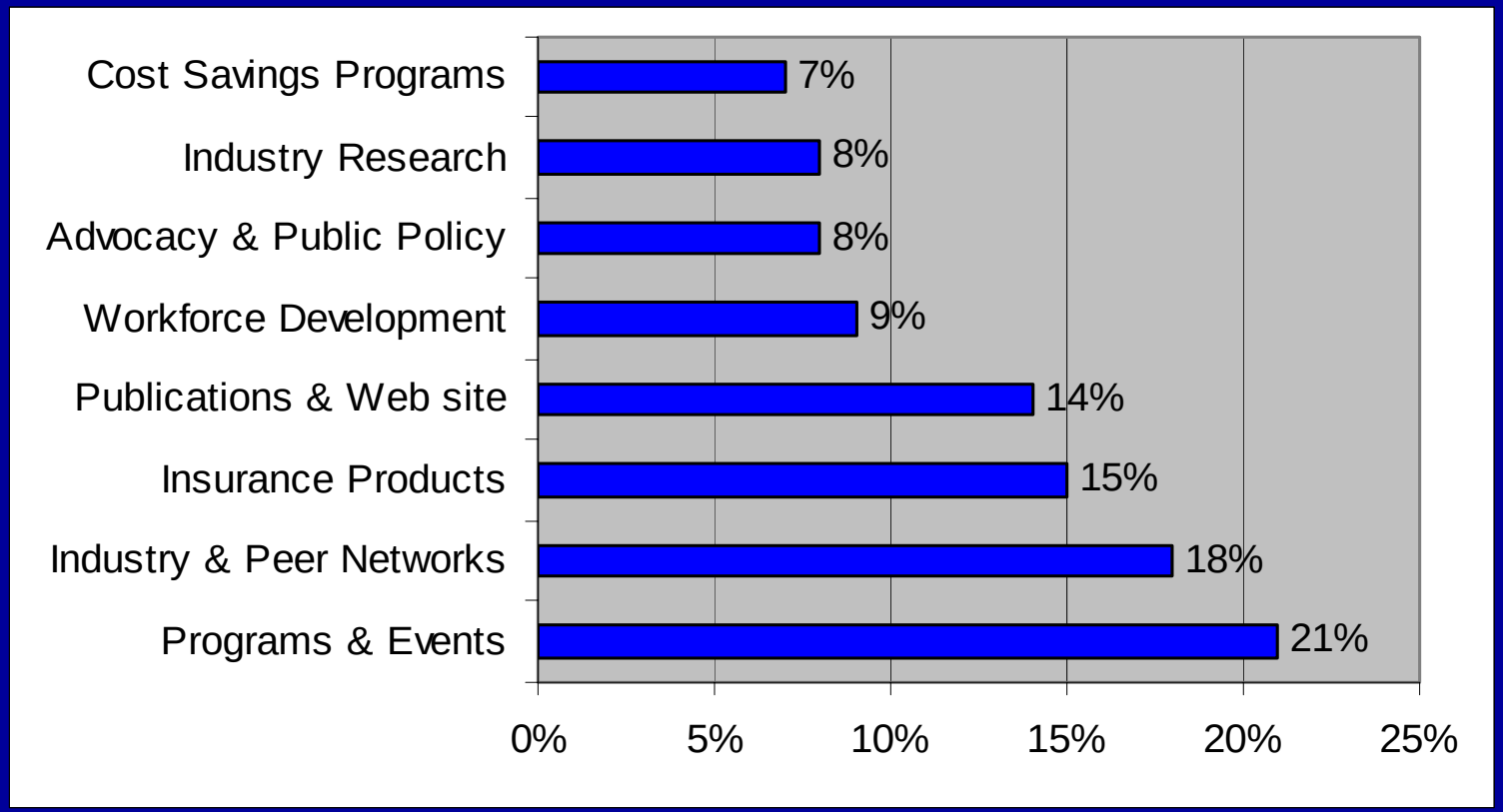
Jointly produce

bid on projects, joint ventures, federal labs

Jointly build economic foundations

telecom, tech transfer, STW

*Members Define Their Needs



*Percentage of survey respondents picking the service offerings listed above as “most important” to their business.

Source: Pittsburgh TEQ

Power of Collaboration: Optics Cluster Example

- **Identify critical mass**

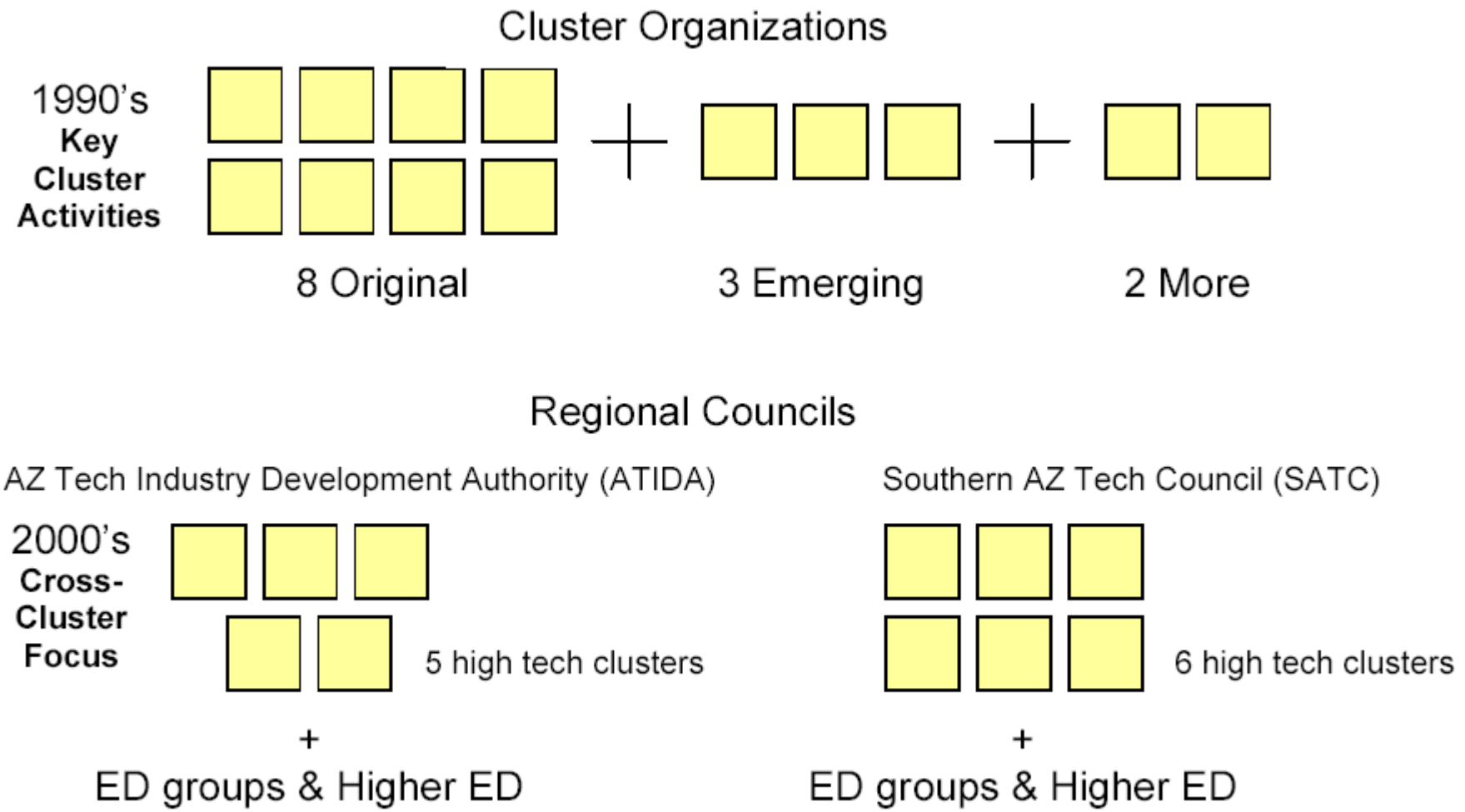
  optical components; optical design software; lasers for medical, industrial and graphics application; optical telescopes; digital electronic camera; and U of A programs
- **formed association**
- **state and local recognition: "seat at the table"**
- **national recognition—*Business Week:* "Optics Valley"**
- **4-year program to build exports**
- **joint ventures among optics firms**
- **joint ventures with other clusters**
- **workforce development: community colleges, school-to-work grant**
- **sales tax increase goes to U of A Optics research**

Power of Collaboration: High-Tech Clusters Example

- Major cities compete for “critical mass” identity
- Joint venture with Tempe to create “Tech Oasis” image
- Tech Tuesday- 500 to 700 young professionals
- ADOC, Greater Phoenix and Greater Tucson Councils assign staff by clusters
- Joint ventures to start Venture Capital Conference and Arizona Tech Incubator
- Joint ventures to change university patent policy
- Workforce development: community colleges, school-to-work grant
- Successful legislative agenda (IT training tax credit, cluster funds)
- Push for Governor’s Partnership for the New Economy
- Sales tax increase earmarked for university research & ed
- Two regional high-tech councils for cross-cluster initiatives

Evolving Organizations

Governor's Strategic Partnership for Economic Development



Industry Clusters as a Service Delivery Tool

Shortcomings in current economic development system

- **One Shot—**with the top goals often being quantity over quality, program staff generally have only 1 or 2 interactions with a given company;
- **One Type—**most services are limited to relatively early-stage and generic assistance;
- **One-On-One—**staff deal with individual companies and assume that brochures and seminars are a way to achieve scale; and
- **One Sided—**programs often sustain only superficial relationships with business leaders, private organizations or other actors in the business development system.

Source: Carol Conway, Corporation for Enterprise development, May 1995

Clusters offer special opportunities to better provide assistance by:

- offering a "critical mass" of customers for consultants and government
- formally incorporating businesses and trade associations in program design
- providing services tailored to industry
- facilitating firms collaborating to compete globally

Place Still Matters — Specialized Infrastructure

"The enduring competitive advantages in a global economy are often heavily local, arising from concentrations of highly specialized skills and knowledge, institutions, rivals, related businesses, and sophisticated customers."

- Michael Porter
Harvard Business School

Anything that is available to rivals elsewhere is essentially nullified as a source of competitive advantage.

High-Technology Location Factors

Existing High-Tech Presence

Traditional Business Costs

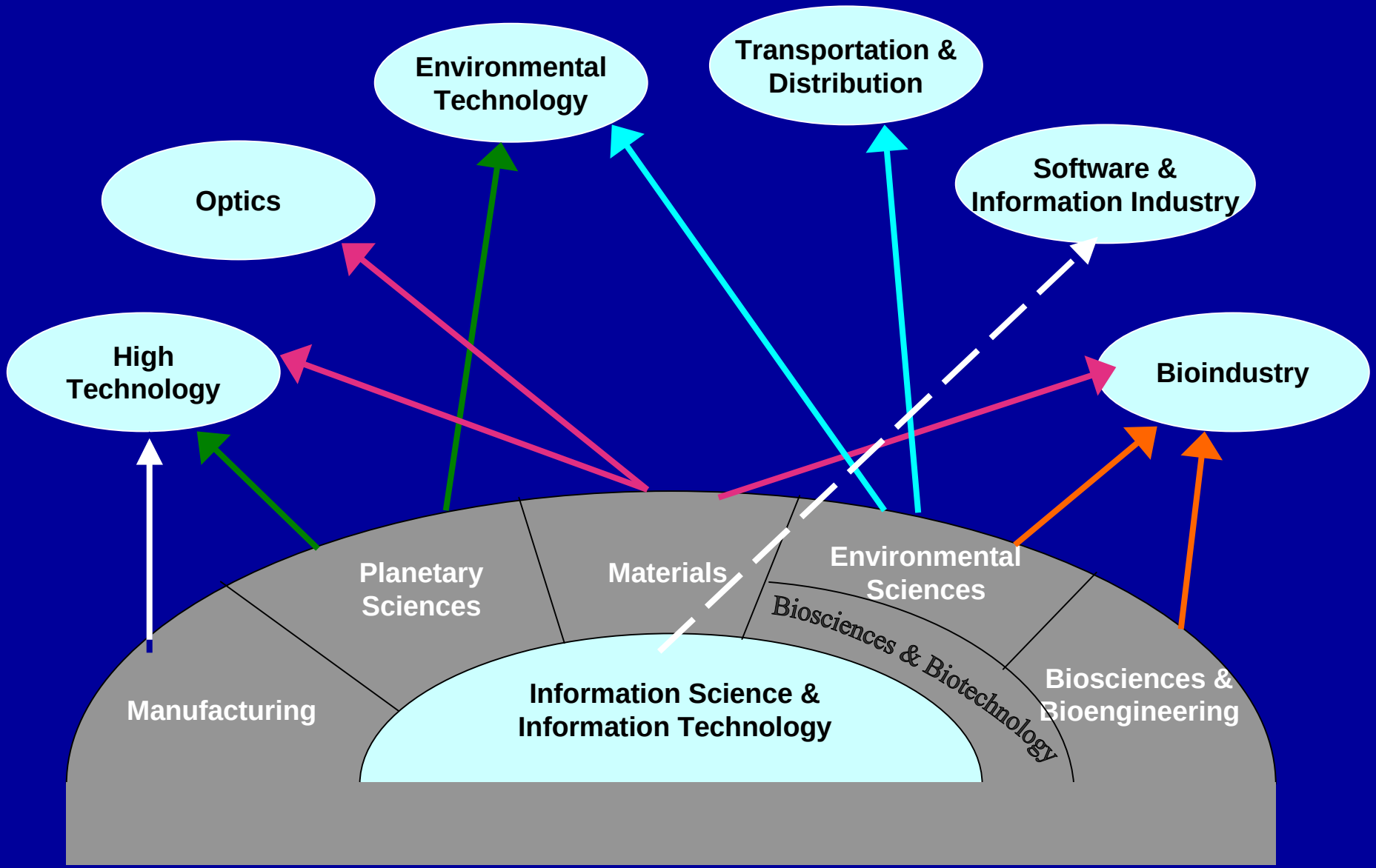
- Tax Structure
- Compensation Costs
- Space Costs
- Capital Costs
- Business Climate

Specific to High-Tech

- Proximity to Excellent Research Institutions
- Access to Venture Capital
- Educated Workforce
- Network of Suppliers
- Technology Spillovers
- Climate and Quality of Life

Source: Milken Institute, *America's High-Tech Economy*, 1999

AZ's Industry Clusters and ASU Research



Region: Three “Big Bets”

- Big Bet No. 1
  Target five export-oriented, knowledge intensive clusters to build regional strengths in:
  - Electronics/Information Technology
  - Aerospace
  - Software
  - Biomedical
  - Advanced Business Services

Region: Three “Big Bets”

- Big Bet No. 2

  Earmarked University Funds – Prop 301
  Citizens have recognized that top-tier universities are a critical infrastructure for the 21st century.
  - Talent producer
  - Talent magnet
  - Technology generator
  - New Knowledge/New Businesses

Priority Cluster Growth Targets

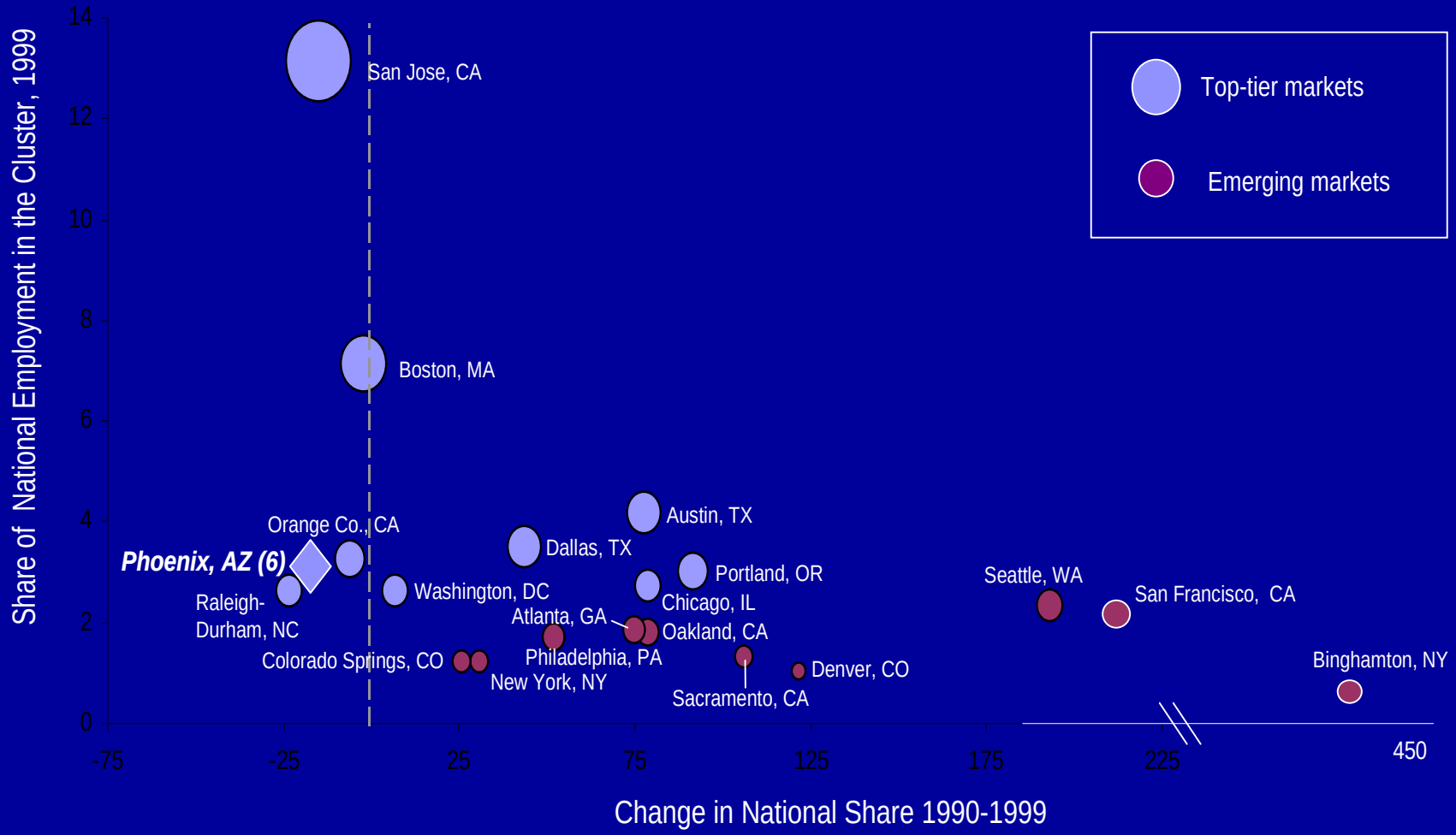
Greater Phoenix can join the top-tier in the identified clusters by striving toward the following targets:

Aerospace	Maintain current employment concentration of 260% of national concentration.	12,300 net new jobs
Bio-industry	Grow to the current US level of concentration.	12,900 net new jobs
Advanced Financial & Business Services	Maintain concentration of 140% of the current US concentration in high wage segments.	27,700 net new jobs
High-technology	Return to 1990 concentration of 220% of the US level (increasing concentration in higher-wage sectors of the cluster)	20,500 net new jobs
Software	Build concentration to 120% of the current US concentration.	32,500 net new jobs

Information Technology Cluster

(includes High-tech and Software)

Share of National Employment



Source: Cluster Mapping Project, Institute for Strategy & Competitiveness, Harvard Business School, 2001.

Region: Three “Big Bets”

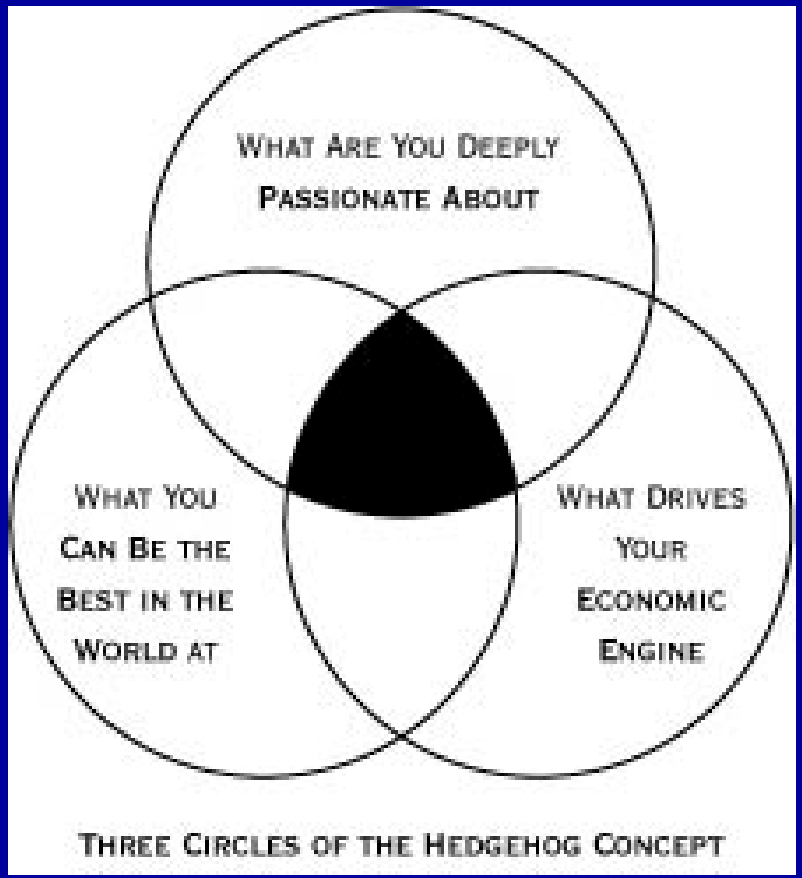
- Big Bet No. 3
  Genomics – $90M raised in 2002 to jumpstart the bioscience industry.
  New roadmap to develop 3 areas:
  - Cancer therapeutics
  - Neurological sciences
  - Bioengineering

Genomics Center

International Genomics Consortium (IGC)

Translational Genomics Research Institute (TGen)

The “Physics” of Good to Great



The “Physics” of Good to Great

- 3 Interlocking Circles
- Stockdale Paradox
- Culture of Discipline
- The Flywheel
- The Doom Loop
- BHAGS (bee-hag)

Staying with It

- 1990-91 ASPED process
- 1992- GSPED; Clusters Incorporate
- 1992-93 regional ED, universities follow framework
- 1994 Senate asks for senior industry cluster
- ASU initiates USDOC & USAEP grants (5)
- Governor's race (1994)
- ADOC targets staff and programs to clusters ($ 167 M workforce; $500,000 CECD)

Staying with It

- GPEC targets staff & programs to clusters
- Several clusters hire ex. directors
- 5 high-tech clusters hire lobbyists
- ADOC updates cluster studies
- *New Economy: A Guide for Arizona (1999)*
- Phoenix & Tucson Chambers adopt clusters
- Governor's new economy task force
- BHAG: Proposition 301 sales tax increase for K-12 education & university research (2000)

Staying with It

- *Five Shoes Waiting to Drop on Arizona's Future (2001)*
- GPEC and ADOC emerge stronger on clusters (new studies 2001-2)
- Legislature keeps cluster funds & NE initiatives in 2002–03 budget (-$ 800 M)
- BHAG: Arizona Biotech Biomedical Initiative - 3 universities, state, 2 cities, 5 clusters, ED groups pursue Genomics Talent
- Feasibility study for Bioindustry research infrastructure (target $ 100 M)

Benefits of Cluster Approach to Economic Development

- First time to mix entrepreneurs and traditional business (banks, utilities) in strategy process
- Cluster-based approach provided a more in-depth understanding of the state economy
- Produced an industry-driven strategy
- Recognized that industry does not speak with a single voice
- Created a broader constituency for economic development
- Changed the way we define the customer